2. A polymer solution in accordance with Claim 1, wherein said polymers are neutral and water-soluble.

3. (Amended) A polymer solution in accordance with Claim 1, wherein at least one of said polymers is polyacrylamide ("PAM"), N-substituted PAM, N,N-disubstituted PAM, modified polysaccharides, polyethylene oxide ("PEO"), polyvinylpyrrolidone ("PVP"), polyvinylalcohol ("PVA"), polyethylene glycol ("PEG"), or a random, a graft or a block copolymer based on the backbone monomer segments thereof, wherein nitrogen substitutes are selected from the group consisting of C_1 to C_3 alkyl, hydroxyl-substituted C_1 to C_3 alkyl, and methoxy-substituted C_1 to C_3 alkyl.

4. (Amended) A polymer solution in accordance with Claim 3, wherein said random, graft or block copolymer is EPE-type, N,N-dimethylacrylamide and N,N-diethylacrylamide ("P(DMA/DEA)"), a copolymer of poly(N-isopropylacrylamide) densely grafted with short poly(ethylene oxide) ("PNIPAM-g-PEO") or polyacrylamide-co-allyl-β-D-glucopyranoside ("P(AM/AG)").

5. A polymer solution in accordance with Claim 3, wherein said polysaccharides are selected from the group consisting of liquified agrose, methylcellulose ("MC"), hydroxyethylcellulose ("HEC"), hydroxypropyl-methyl-cellulose ("HPMC"), hydroxypropylcellulose ("HPC"), glucomannan, galactonmannan and dextran.

6. A polymer solution in accordance with Claim 1, wherein at least one of said polymers is a silica-absorbing polymer that suppresses electrophoendoosmotic flow and charged macromolecule-silica interactions.

a2

7. (Amended) A polymer solution in accordance with Claim 6, wherein said silica-absorbing polymer is selected from the group consisting of PVP, PEO, EPE-type, N-substituted PAM and N,N-disubstituted PAM, and wherein nitrogen substitutes are selected from the group consisting of C_1 to C_3 alkyl, hydroxyl-substituted C_1 to C_3 alkyl, and methoxy-substituted C_1 to C_3 alkyl.

8. A polymer solution in accordance with Claim 1, wherein said interpenetrating network has a more expanded structural formation than the entanglement structure of a corresponding homopolymer solution, and has a larger effective size than that of a corresponding homopolymer solution, representing an effective entanglement network greater than that of the corresponding homopolymers, and wherein said interpenetrating network has a lower molecular weight per volume than the corresponding homopolymers.

9. A polymer solution in accordance with Claim 1, wherein said interpenetrating network is prepared by synthesizing a first polymer in a matrix of a second polymer solution.

10. A polymer solution in accordance with Claim 1, wherein said polymer solution provides at least a 500-base read length in one run for a single-stranded DNA separation.

a3

28. (New) In a method of separating charged molecular species, the method comprising causing a charged molecular species to migrate in a separation medium by the influence of an applied electric field, the improvement wherein the separation medium comprises a plurality of different polymers that do not phase separate when dissolved in solution and that are entangled to form an interpenetrating network.